States" [1] and "Influences of Climatic Conditions and Weather Changes in the Functions of the Skin." [2]

Dr. Cline undertook to investigate the relation between the causation and fatality of certain diseases and weather changes which take place from day to day, as these appear of greater importance than the seasonal changes on account of their suddenness and frequency which shock the system even when in health. Sudden weather changes are unfavorable to the successful treatment of most diseases, but in a few diseases certain changes prove favorable. Decided change in temperature excites the nerve centers and in exciting the vasomotor center disturbs the vascular system and causes the capillary vessels to become gorged and paralyzed, which is a cause for inflammation in the affected parts. The effect is pronounced in decided falls in temperature in localities where there is a large diurnal range and where there is a wide difference between sun and shade temperature. Dr. Cline discusses the whole question of the adjustment of the human organism to these various changes and the possible occurrence of local or general congestion.

Dr. Cline furnishes an interesting problem in discussing the relation between inspired and expired air and the state of the bronchial mucous membrane. The quantity of water given off from the system in the form of vapor in excess of that received during respiration depends almost entirely upon the temperature of the air inhaled. Assuming that the air leaves the body at a temperature of 98.5° F. and saturated with moisture, it would carry off from the lungs of a person of average size in one day 6,636 grains of water in the form of vapor. In localities, for example, having an average mean daily temperature of 32° F. during the winter and the average relative humidity 75 per cent, each cubic foot of air would contain about 5.1 grains of vapor of water. The amount of water taken into the lungs by respiration during 24 hours under these conditions would be 1,785 grains; while the amount exhaled, 6,636 grains, shows an *excess* of water *given off* from the system through respiration over that received amounting to 4,851 grains daily. The excess becomes greater as the temperature goes lower and less as it rises, while the per cent of moisture remains constant. To furnish the complement of water between the amount inhaled and that exhaled rapid evaporation takes place from the lining mucous membrane of the air passages and air cells of the lungs wherever such weather prevails.

The fluids from the pulmonary circulation which normally keep the lining membrane of the lungs moist contain more or less of the nonvolatile salts carried in solution in the blood.

An interesting conclusion by Dr. Cline follows: These salts are left as a deposit from the water carried out of the lungs during respiration in quantities depending upon the amount of salts in the blood at the time and the extent of the evaporation which takes place. He claims and cites authorities to show albumen will not pass through an animal membrane toward pure water, while it will pass to a solution of salt, and that the more rapid the movement of the fluid the greater is the amount of albumen which passes through to the salt solution. Hence an excess of saline solution on the mucous lining of the lungs favors the exudation of albumen into the air passages and air cells. Dr. Cline believes that this condition favors pulmonary disease in affording lodgment and a favorable environment for the growth of pathogenic organisms. Against such a theory it may be urged that whatever tendency there may be toward a concentration of salt in the lining membrane of the air passages would be met by diffusion or osmosis so as to preserve an equilibrium. Any momentary change would be quickly restored by the vast reserve in the general blood-supply.

Albuminous substances may pass through an animal membrane if the salt concentration is sufficient to injure it; but it should be remembered that the common method of *separating* albuminous substances in solution *from* salts is by dialysis.[3]—*Guy Hinsdale.*

[1] Galveston, Tex., 1895, 23 pp.
[2] Galveston, Tex., 1896, 8 pp.

AUTHOR'S NOTES.

Notwithstanding Dr. Hinsdale's statements of conditions which appear against my theory regarding lung diseases, I believe that further research dealing directly with the human organism will substantiate the conclusions I have reached.

When the physical organism is normal in all respects the vast reserve in the general blood supply no doubt would quickly overcome momentary changes and prevent the formation of conditions in the lungs favorable for the lodgment and development of disease germs. However, when an individual is somewhat indisposed, as is frequently the case, the human organism does not function as nature intended and it is then that conditions develop in the lungs which favor pulmonary disease in affording lodgment and favorable environment for the growth of pathogenic organisms.—*I. M. Cline.*

THE INFLUENCE OF INFINITESIMAL TRACES OF NUTRITIVE SUBSTANCE IN THE HUMIDITY OF THE AIR UPON CONTAGION.

By A. TRILLAT.

[Abstracted from *Comptes Rendus*, Paris Academy of Sciences, t. 171, pp. 282-284, July 26, 1920.]

The author, having previously shown (*C. R.*, 170, 1529, 1920) that the mortality among mice exposed to contagion is much greater if the surrounding air is saturated at the time of exposure than if it is dry, has now repeated his former experiments, introducing into the humid air 1/1,500,000 part by volume of ordinary bouillon. Numerous experiments confirm the fact that the favorable influence of humidity upon the spread of contagion is markedly augmented by the presence of infinitesimal traces of such nutritive substance. It has been shown before (*C. R.*, 155, 1184, 1912) that the vitality of microbes in suspension in the atmosphere is extraordinarily sensitive to physical and chemical agents.

Now, in nature the humid atmosphere is rarely pure—there are present respired gases, and emanations from the soil, all containing solid matter in suspension. It is especially important in practical hygiene to get rid of all respired air, since the humidity and nutritive substance contained therein is highly favorable for the rapid multiplication of microbes and the ready spread of contagion.[1]—*E. W. W.*

[3] Cf. Hinsdale, Guy: Atmospheric Humidity, *Bull. of the Medico-Chirurgical College of Philadelphia*, 1911, pp. 1-5.
[1] Cf. MONTHLY WEATHER REVIEW, May, 1920, 48; 284.